

*With Mr Pryde's  
Compliments*

**GRAND TRUNK RAILWAY COMPANY  
OF CANADA.**

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**MISSION OF ENQUIRY TO CANADA.**

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**REPORT OF CAPTAIN TYLER**

ON THE

**CONDITION AND PROSPECTS**

OF THE

**GRAND TRUNK RAILWAY,**

**DECEMBER, 1867.**

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LONDON:

WATERLOW & SONS, PRINTERS, CARPENTERS' HALL, LONDON WALL.

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THE GRAND TRUNK RAILWAY COMPANY  
OF CANADA.

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NOTICE is hereby given, that the Ordinary Half-Yearly General Meeting, and the Special Meeting, adjourned from the 31st day of October last, will be held at the CITY TERMINUS HOTEL, CANNON STREET, LONDON, E.C., on THURSDAY, the 19th day of DECEMBER next, at One o'clock p.m. precisely.

By Order,

EDWARD W. WATKIN,  
*President.*

JOHN M. GRANT,  
*Secretary.*

Grand Trunk Railway Offices,  
21, Old Broad Street, London, E.C.

November 1st, 1867.

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## DIRECTORS' REPORT.

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*December 11th, 1867.*

It will be in the recollection of the Bond and Stockholders that the ordinary half-yearly meeting, convened for the 31st of October last, was adjourned, because at that date Captain Tyler was still in Canada. He has since returned, and his report was this day presented to the Board. This important document the Directors lose no time in placing before the Proprietors.

Captain Tyler, it will be remembered, was invited by a special resolution of the Proprietors, at the meeting held on the 30th of May last, to proceed to Canada, and there to consider and report upon the several matters which had at that meeting been discussed. As already stated, he consented to undertake that important duty,—Mr. Eborall being associated with him for the purpose; and immediately prior to their departure the following joint letter was addressed to those gentlemen :—

LETTER OF INSTRUCTIONS TO CAPT. TYLER, R.E., AND  
C. W. EBORALL, Esq.

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*LONDON, August 7th, 1867.*

DEAR SIRS,

The Board have from time to time discussed the question of the rates in operation for the Through Traffic over the Grand Trunk—more especially since the abrogation of the Reciprocity Treaty.

That Traffic has for some time been carried on at low rates, caused by the competition of the American routes, and has been paid for in the depreciated currency of the country.

The Directors have considered the profit on these transactions too small, but they have consented to persist in competing for the traffic. 1st, because they had reason to hope for a return to specie payments at an early period; and 2ndly, because having at much trouble and sacrifice made a connection via Sarnia for this traffic, they did not think it wise to throw it up for slight reasons.

But they have, so far, been disappointed as regards the question of Currency, and a very natural feeling has grown up that much of this traffic is carried at so small a profit as to render it desirable to cease for a time to convey it.

Again, the Working Expenses of the Railway have been seriously augmented from the very same artificial cause, and the cost of renewing the Permanent Way still comes out at an unexpectedly high figure. It is difficult, if not impossible, to decide the real question raised, viz.: will doing less work yield more net profit on this side. For the question, which is not merely one of money, but of Policy, depends so much on the probabilities of the future.

Under these circumstances the Board wish you to discuss the whole matter for them, with Mr. Brydges and Mr. Hickson, and on your return to London, to give them your united opinion upon this subject.

Your visit will enable you to inspect the whole Line and Stations, and the Board, while feeling every confidence in the Staff in Canada, and not intending in any way to weaken or question their authority, will be happy to find that any suggestions which strike you are candidly and thoroughly discussed between you, as eminently practical men on one side, and the Company's two able and experienced Chief Officers above-named on the other.

These discussions will also naturally include the consideration and comparison of facts regarding the amount of expenditure necessary to put the Line and Plant into efficient working order with regard to Canadian standards of completeness, and to the kind of traffic to be procured, as well as the amount of capital required, you will also direct your attention to the distribution of it, both in point of time and locality.

It will naturally occur to you to ascertain as far as possible the probable effect on the Grand Trunk system of the completion as now provided by the Confederation Act of the Intercolonial Railway, always remem-

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bering that that railway will be constructed by the independent action of the Dominion.

The Directors desire also to be informed whether profitable results would arise from the laying down of a third rail, so as to accommodate American traffic without break of gauge, on the western portions of the Grand Trunk. They would be glad to learn between what points such a third rail (if desirable at all) could be laid with most advantage, the probable cost, and the probable time to be occupied in completing the work.

You will learn the results of the Traffic arrangement of March last with the Great Western of Canada Railway, and you may probably be able to make suggestions for further effective arrangements of a similar mutual and amicable kind with that or other Companies.

It is the desire of the Directors that all the topics referred to in this letter should be discussed by you in the freest manner with Mr. Brydges, Mr. Hickson, and the staff in Canada, and should be reported upon by you jointly to the Board in London as early as possible after your return to this country.

As you are both fully aware from the repeated personal interviews which have taken place with you, the object of the Board in asking you to favour them and the Company by undertaking this mission, is eminently and purely *practical*. The Directors feel that the American War has plunged the Company into most severe, prolonged, and perplexing difficulties, has defeated the most careful calculations, and has disturbed plans of policy apparently framed in the most cautious spirit.

The Board desire that the Bond and Shareholders should have afforded to them the soundest and most independent means of judging whether the best course has been followed in dealing with these new, embarrassing, and unforeseen events. And therefore it is that you have been requested to proceed to Canada, and to apply your previous large experience, and the new facts you will there collect in discussing with the Executive of the Company on the spot the present state of the property, and the most certain and economical means of increasing the revenue, and lessening the expenditure.

The Secretary will forward to you a complete set of Reports, Acts,

&c., relating to the Company, and the Officers will supply any information necessary for the purposes of your mission, subject, of course, to the condition that such information is to be regarded by you as confidential.

(Signed) E. W. WATKIN, *President*.  
J. M. GRANT, *Secretary*.

The Directors have to state that in consequence of the strong representations which were made to them by the Deputation named at the meeting of the 31st October in regard to those clauses in the Permissive Bill, which had reference to the suggested consolidation of the several classes of Bonds and Stocks into an uniform Preference Debenture Stock, the said clauses were withdrawn and the powers of the Bill have been wholly confined to the raising of further capital, not exceeding £500,000, by the issue of Equipment Mortgage Bonds No. 2 (which Bonds are in no way to interfere with the priorities and rights of the existing Equipment Bonds)—and to the enabling of certain alterations, (with the consent of the respective Companies) in the existing agreements with the Buffalo and Lake Huron and Montreal and Champlain Railway Companies. The Bill so amended was duly forwarded to Canada.

A copy of the Bill may be had by any Bond or Stockholder on application to the Secretary.

By order,

EDWARD W. WATKIN,  
*President*.

Grand Trunk Railway Offices,  
1, Old Broad Street, London, E.C.

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TKIN,  
President.

CAPTAIN TYLER,

TO THE

DIRECTORS OF THE GRAND TRUNK RAILWAY  
COMPANY.

*High Elms, Hampton Court,*

*11th December, 1867.*

GENTLEMEN,

In compliance with the instructions contained in your letter of the 7th August last, and with the request which was made to me earlier in the year by the Directors and Shareholders of the Grand Trunk Railway Company, I duly proceeded on the 7th September to America, in company with Mr. Eborall, and have since made an inspection of the Grand Trunk Railway of Canada.

I have in the course of that inspection received full information from Mr. Brydges, Mr. Hickson, and other officers and agents of the Company on all points, and have had every opportunity of discussing with them at the various places of interest in the United States and in Canada those questions of construction, maintenance, traffic, working, and management, which demanded attention.



I have also had the advantage of conferring with the Presidents and Officers of the Railways of the United States working with or competing against the Grand Trunk Railway, as far south as Baltimore and as far west as Chicago. In travelling upwards of 5,000 miles in the States and Canada (including the provinces of New Brunswick and Nova Scotia), I have been afforded every facility, and have met with the greatest courtesy, both from the officers of the American railways whilst visiting their works and establishments, and from Mr. Swinyard and the officers of the Great Western of Canada Railway in going over that line.

#### **Grand Trunk System and Competing Routes.**

The Grand Trunk system, comprising a total length of 1,377 miles, and covering an area of about 28 square miles, is subjected to warm competition for a large proportion of its traffic. It competes for Through Traffic between Chicago in the west and Portland Boston, and New York in the east, with the following routes:--

- (1). The Great Western and New York Central Railways, by Detroit, Suspension Bridge, and Albany.
- (2). The South Shore lines of Lake Erie over the New York Central, and Erie systems.
- (3). The Pittsburg, Fort Wayne, and Chicago Railway over the Atlantic and Great Western, and Erie Railways.
- (4). The same line over the Pennsylvania Central Railway.



(5). The Chicago and South Eastern over the Ohio Railroads to Baltimore.

(6). The water route of the lakes and the St. Lawrence.

It competes for Local Traffic in Upper Canada with the Great Western Railway at Windsor, Sarnia, London, Paris, Guelph, Buffalo, and Toronto; and directly over nine-tenths of its length during the summer season with the waters of the lakes and the St. Lawrence.

On the other hand, the principal connections with the system in the west are :—

(1). The Michigan Central and Michigan Southern Railroads, which exchange "all rail" traffic between Chicago and Detroit with the Grand Trunk Railway at Detroit Junction.

(2). The steamers by Lake Michigan and Lake Huron, which exchange traffic with the Grand Trunk Railway at Sarnia.

(3). The Dayton and Michigan Railroad, which connects the system at Detroit with Cincinnati.

While on the east the Vermont Central Railroad forms a useful connection between Montreal and Boston; and good steamers run from Portland to Boston and New York, as well as to St. John, New Brunswick, and to Halifax.

The distance between *Chicago* and *Portland* by the Michigan Central and Grand Trunk Railways is 1,145 miles. The distances between *Chicago* and *Boston* by the various competing lines are :—

Grand Trunk Railway	<i>via</i> Portland ...	1,253 miles.
	<i>via</i> Vermont Central Railway...	1,187 "
Great Western and New York Central		
Railways	... ..	1,016 "
Lake Shore and Erie Railways	...	1,195 "
Pennsylvania Central Railway, <i>via</i> Pitts-		
burg	... ..	1,145 miles.
Baltimore and Ohio Railway	...	1,246 "

The distances from *Chicago* to *New York* are :—

Grand Trunk Railway, <i>via</i> Michigan Central Railway and Portland	...	1,487 miles.
Grand Trunk Railway, <i>via</i> Michigan Central Railway, Buffalo, and New York Central Railway...	... ..	989 "
Grand Trunk Railway <i>via</i> Detroit, Buffalo, and Erie Railway would be	...	965 "
Great Western and New York Central	...	960 "
Pennsylvania Central Railway...	...	918 "
Baltimore and Ohio Railway	...	1,012 "
By Toledo, Cleveland, and Dunkirk	...	960 "
By Crestline and Dunkirk	... ..	957 "
By Mansfield and Salamanca	... ..	976 "

### Agencies.

The competition thus continually carried on for traffic has led to the extensive employment of "Agencies" on the part of these various companies. The Grand Trunk agent at New York, Mr. Beach, sells passenger tickets, makes contracts for freight, and exercises a supervision

53 miles. over other agents. There are Grand Trunk offices at  
 87 " Bangor, Boston, Buffalo, Chicago, Detroit, Milwaukee,  
 16 " New York, and Ogdensburg, with an average of three  
 95 " paid agents for each office. The paid agents make the  
 greater number of contracts for Freight, and there are  
 45 miles. about 30 sub-agents in communication with each office,  
 46 " employed principally in the sale of Passenger tickets.  
 :— The cost of these agencies in the States and in Canada,  
 as charged in the accounts for the past half-year, to 30th  
 187 miles. June, 1867, was £8,804, against £9,704 for the first half-  
 year of 1866. The charge for the year 1865 was £18,903 ;  
 for 1866, £19,591. The amount of traffic obtained by  
 them for the year ending 30th June, 1867, is estimated  
 at \$898,000, or, after deducting the proportion to other  
 989 " companies, at about £100,000. Other companies adopt  
 similar measures for obtaining traffic. The Baltimore  
 965 " and Ohio, and the Pennsylvania Central Railroads have  
 960 " agencies at Portland and even at Bangor, the former  
 918 " being 500 and the latter 650 miles to the north of  
 012 " Philadelphia.  
 960 " The Great Western Railway Company charged  
 957 " in their accounts for the past half-year £3,541,  
 976 " and for the first half-year of 1866, £4,695 for adver-  
 tising and agency. Any fusion of the Agencies of  
 the Grand Trunk and Great Western Companies,  
 in the event of more intimate relations being here-  
 after established between them, would naturally lead  
 to a joint arrangement also with regard to the  
 agencies of the Michigan Central Company, which are  
 already combined in some places with those of the Great

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Western Company. These three companies would thus be in a better position to compete economically with the combination of the "Michigan Southern, and Lake Shore" and other railroads. The Agency Expenses incurred in the competition between the Grand Trunk in its own behalf and the Great Western Company in opposition to it, would cease. The proportion payable by the Grand Trunk Company for agency falling to, say one-third of its present rate, the per centage of agency expenses to nett profit (gained upon low rates), and the commission upon passenger traffic (which now amounts to about 20 per cent. on the receipts), would be materially decreased. And more remunerative rates for freight east and west would be established.

#### **Express Companies.—American Lines.**

The employment of *Express Companies* is another feature in the working of American Railways which must not be lost sight of in considering the question of competition with them, and the difficulties of avoiding it. These companies were originally formed with the idea of facilitating (in the absence of through-rates between the different Railroad Companies and clearing-house arrangements), the conveyance of traffic over *continuous systems of different lines*; and they have in years past been a source of great profit.

The officers of the railroad companies are, as shareholders, in many cases directly interested in their success, and they have made advantageous terms with the railroad companies. They assist in advertising the

different routes, and bring in a considerable amount of traffic to the railroad companies; and their names are conspicuous on the cars of the Lines over which they run, even when they are not used for their special traffic. The profits of the Express Companies have, however, declined of late years, as competition has increased. They have generally valuable property in the principal cities where they conduct business, and considerable sums of money invested in horses, wagons, &c.; but the value of their assets does not, it is stated, bear more than a fractional proportion to their nominal Capital, which is as follows:—

The American Express Company .....	\$9,000,000
The Adams' Express Company.....	10,000,000
The United States Express Company...	6,000,000
Wells, Fargo and Company .....	10,000,000
The Merchants' Union Company.....	20,000,000
Their gross Receipts for the first seven months of the present year were :—	

American .....	\$1,217,510
Adams' .....	1,990,030
United States .....	1,312,858
Merchants' Union ...	2,043,351

The establishment of the last-mentioned company has caused a very considerable reduction in the market value of the shares of the other companies.

The public favour the Express Companies for several reasons. They have only one company to deal with in regard to traffic which passes, perhaps, over several

different lines of railroad. They obtain from them greater facilities in collection and delivery. They trust them with money and valuable freight of all descriptions, in the conveyance of which the Express Companies do business and assume risks which the railroad companies would hardly undertake. They frequently pay higher rates to those companies than they would be required to pay for the same service directly to the railroad companies, under the belief that their traffic commands greater attention, and is conveyed with greater speed and safety than ordinary railroad traffic.

These Express Companies have met with much opposition from time to time, and attempts have been made to break them up; but the arrangements which they have succeeded in effecting with the railroad companies are of so important a character, cover so great an area of territory, and involve such large pecuniary considerations, that it will probably be a long time before the railroad companies seriously attempt to supplant them by the establishment of additional agencies in the cities and towns where their business is principally conducted. It is necessary, in any case, to consider them with regard to the present subject, as a permanent institution, and as a standing means of aid to competition between east and west on the North American Continent.

#### **Rates as modified by Competition and Seasons.**

Under the above circumstances of competition, against Water Navigation for six or seven months in the year,

and against other railways more favourably situated in many cases as regards length, and in every case as regards Climate, all the year round, the rates and fares charged on the Grand Trunk system for the conveyance of goods and passengers are very low. The rates, for instance, which prevailed during the first three months (July, August, September,) of the current half-year averaged for Foreign traffic *viâ* Sarnia and Portland, 1.  $\frac{30}{100}$  c. in American currency, or say  $\frac{92}{100}$  c. in gold (less than a halfpenny) per ton per mile. Flour, which formed a great part of the traffic, was carried as low as one cent (one halfpenny) per ton per mile during the summer between Montreal and Toronto. Some of the lowest rates are, however, on the Rivière du Loup and Quebec districts, where the traffic is also lightest. Lumber traffic is, in some instances, carried in summer at less than a cent per ton per mile, such traffic not being otherwise obtainable. The rates in Winter cannot, of course, be raised above that point at which the merchants would be induced to keep back their produce for the opening of navigation and the period of low summer rates.

The Steam-boat fare for 170 miles between Quebec and Montreal is \$3 per passenger, and the steamers carry the bulk of the traffic even when the first class fare by railway is less than one penny sterling per mile. Between Quebec and Riviere du Loup the Steam-boat fare has been as low as \$1 per passenger for 120 miles. Water competition reduces the railway freight rates in Summer to the figures stated in the following table :—



MONTREAL TO															
KINGSTON 172 Miles.				TORONTO 333 Miles.				GUELPH 381 Miles.				LONDON 454 Miles.			
CLASS.				CLASS.				CLASS.				CLASS.			
Rate per 100 lbs.				Rate per 100 lbs.				Rate per 100 lbs.				Rate per 100 lbs.			
1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	
c.	c.	c.	c.	c.	c.	c.	c.	c.	c.	c.	c.	c.	c.	c.	
20	13	12½	12½	25	20	17½	17½	35	25	23	20	46	30	27	
These rates average per ton of 2,000 lbs.															
\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
2.30	1.50	1.50	1.50	1.50	1.20	1.00	1.00	1.81	1.33	1.30	1.10	2.50	1.30	1.20	

During the past summer the Passenger fares on the Riviere du Loup section were as low as  $1\frac{5.5}{100}$  cent and  $1\frac{8}{100}$  cent per mile; between Toronto and Detroit  $1\frac{2.7}{100}$  cent per mile; between Montreal and Point Levi (for first-class passengers)  $1\frac{4.5}{100}$  cent per mile; between Detroit and Portland only \$9.50, or  $1\frac{1.0}{100}$  cent per mile. And during a short period of competition with steamboats they fell to  $1\frac{5.0}{100}$  of a cent per mile.

### Working Expenses and Earnings.

The Working Expenses, including discount on American currency, amounted for the year 1866, as accurately as can be ascertained, for Passenger trains to \$1.02 per train

LONDON			
454 Miles.			
CLASS.			
Rate per 100 ll			
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e.	c.	e.	
46	30	27	
\$ c.	\$ c.	\$ c.	
2.00	1.30	1.20	

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mile, and for freight trains to \$0.97 per train mile: or, for the whole, to 99 cents per train mile. The total earnings for the same year reached \$1.44 for passenger trains, and \$1.29 for freight trains, or for the whole \$1.36 per train mile. The working expenses for that year, which were 69.65 per cent. for the first half, and 76.15 per cent. for the second half, averaged 72.9 per cent. of the gross receipts. The results of the first half of the current year—1867, were still more discouraging, inasmuch as the total working expenses amounted (including discount on currency and renewals) to 85 per cent. on the gross receipts. This unfortunate result was owing to a falling off in traffic after the defective Harvest of 1866, to the rise which occurred at the same time in the price of labour and the cost of fuel, to the heavy charges for renewal and maintenance, and to certain contingencies.

The expenses on the Grand Trunk Railway per Train Mile are light in comparison with those on other railways in Canada and the United States, though not with those in England, being, as stated, \$0.99 for the year 1866,—against \$1.10 for the Great Western of Canada Railway,—\$1.51 for the Michigan Southern Railway,—\$1.83 for the New York Central Railway,—\$1.70 for the Erie Railway,—\$1.41 for the Illinois Central Railway,—\$0.97 for the Northern Railway of Canada,—\$1.82 for the Chicago, Burlington and Quincy Railway,—and 2s. 5½d. for the United Kingdom. But the earnings are also light as compared with most of those lines, being, per train mile, only \$1.36 for the Grand Trunk Railway,—against

\$2.37 for the Great Western Railway,—\$2.37 for the Michigan Southern Railway,—\$2.35 for the New York Central Railway—\$2.18 for the Erie Railway—\$2.11 for the Illinois Central Railway—\$1.48 for the Northern of Canada Railway—\$3.34 for the Chicago, Burlington and Quincy Railway—and 5s. 1½d. for the United Kingdom. The average number of Cars in the Freight trains is estimated at 15½, and the average nett load of each train at 150 Canadian tons of 2,000 lbs., the Through freight traffic being generally carried in heavier, and the Local freight traffic in lighter trains. The average number of Passengers per train in the year 1866 was, as nearly as can be ascertained, 120. The nett cost of conveyance per mile for each ton of goods was, on this calculation, 0.65 of a cent., and for each passenger 0.85 of a cent; deducting these from the Earnings there was an average profit in that year of 0.35 of a cent., or a little over 29 per cent. on each passenger, and 0.21 of a cent., or a little over 24 per cent. on each ton of goods.

I conclude, both from the figures and explanations which I have received, and from personal observation along the line of the railway, that the Working Expenses have, under the circumstances in which the Company was placed, been kept down as much as possible, and that though the rates and fares have in many cases brought in but very little profit, yet none of the traffic has unless in certain exceptional cases been actually carried at a loss. The above per centage to the receipts may, however, be reduced in the future. The comparative cost

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of Maintenance ought to be considerably less when the Permanent Way and Rolling Stock (as I shall show hereafter) are in better condition. The general expenses will bear a smaller proportion to the receipts as the traffic increases. The passenger trains, which are at a minimum, averaging two trains a day each way, will be better filled. The loss which the Company now suffers annually in maintaining and working the line from Quebec to Riviere du Loup, will be converted into a profit after the opening of the Intercolonial Railway. The cost of Labour and Materials, which have been inflated as a result of the War in America, will sooner or later fall to something like their normal rates. Peat Fuel will be cheaper than wood. The Freight cars which now weigh ten tons and carry ten tons of load, may be so constructed in future as to carry a greater proportion of nett load to dead weight, and a step has already been made by Mr. Eaton, the Locomotive Superintendent, in this direction. The costs of Agency will be decreased when the time has arrived for an amalgamation of interests with the Great Western Railway, and for working arrangements with other lines.

On the other hand, the Nett rates and fares for foreign traffic will improve as the loss by discount on American Currency (to which I shall hereafter specially refer) decreases. They may be somewhat raised at the same time that the traffic will improve as increased facilities are afforded for its conveyance, and when the Road and Rolling stock, being in better condition, find greater favour with, and gain greater confidence from, the

travelling public. The settlement of the country, and the further development of its resources will tend towards the same result. They will be raised to some extent when it becomes possible to make tariff arrangements for the avoidance of competition with other Companies; and a greatly increased mileage for the joint traffic would also be obtained by a fusion of interests with the Great Western Company.

There will, apparently, be difficulties in the way of making arrangements with the American Companies for some time to come. The various Through rates from Chicago to the New England States are in the hands of numerous (altogether about thirty) Companies, with diverse interests, more or less bound to express Companies, and unable to agree with each other. They have all been, and are still, compelled to charge low fares, because the New York Central Railway is not permitted by law of the State of New York to demand more than 2 cents. in Currency per passenger per mile between Buffalo and New York. This fare was exacted as a maximum from the New York Central Company when the amalgamation of the lines from Albany to Buffalo and Suspension Bridge was sanctioned; and it has borne very hardly upon that, as well as upon other Companies, from time to time, but especially when gold was at a much higher premium. The Company have twice succeeded in passing a Bill through the Legislature of New York for the purpose of evading this obligation, but it was in each case vetoed by the Governor of the State.

Half-year  
Dec., 1

\$72.47  
\$101.88

\$48.32

Negotiations have, however, recently been carried on between the Hudson River, the New York Central, and the Lake Shore and Michigan Southern Railway Companies, which will probably be followed, sooner or later, by combinations, first between these lines, and afterwards of continuous lines on other through routes; and, as these are more or less carried out, agreements as to equal rates and fares between the East and the West will be facilitated. This is a subject in regard to which it would appear that no further action can now be advantageously taken; but it will, doubtless, be kept steadily in view, and no proper opportunity will be neglected in future of combining agencies, and of agreeing to raise fares at competing points.

### Analysis of Traffic.

The relative and actual Traffic Value of the various districts of the Grand Trunk Railway, and the improvement upon them since the year 1862, is shown in the following analysis, in which, after deducting cartage, wharfage, and such charges, the *gross Receipts are given in dollars per Mile per week*, as the average for the half-years ending in the periods stated:—

Half-year ending Dec., 1862.		miles.	30th June.		31st. Dec.	
			1867.	1866.	1865.	1866.
\$72.47	Grand Trunk Proper, ...	882	\$ 84.84	87.20	\$100.40	97.07
\$101.88	Atlantic District .....	149	122.58	126.31	146.22	143.23
	Montreal and Champlain	84	48.47	51.99	60.47	68.43
	Buffalo and Goderich ...	161	63.88	69.69	68.83	82.89
\$48.32	Detroit and Port Huron	59	90.01	112.34	121.64	115.69
	Doon Branch.....	7	2.86	2.71	2.19	2.81
	Three Rivers Branch.....	35	11.28	8.88	14.38	11.75
	Total ...	1377				
	Average of the whole ...		82.19	89.89	\$97.46	96.81

And the following are similar averages for certain portions of the above districts :—

Half-year ending Dec., 1862.		Dec. 31st,	
		1866.	1865.
\$63.64	Sarnia and Toronto .....	\$120.68	114.70
106.12	Toronto and Kingston .....	140.24	130.42
104.82	Kingston and Montreal .....	132.52	126.58
100.96	Montreal and Richmond .....	116.34	114.98
37.87	Richmond and Point Levi .....	40.55	39.88
67.40	Richmond and Island Pond .....	86.13	98.43
12.66	Chandiere Junction and Rivière du Loup .....	14.12	15.77

This Traffic must always be of a fluctuating character, dependent to a very considerable extent upon the Harvests; being, relatively, lighter in summer, when the competition from the water is greatest, and heavier after harvest-time and on the opening of Navigation in May.

### Increase of Traffic.

Of the two descriptions—local and through traffic—of which it is made up, the Local traffic can only grow gradually as the country becomes settled and its means of production are increased, while the Through traffic is already in existence in ample quantity and increases more rapidly. Much more of it might in the Spring and Fall, and even during the Winter, be carried over the Grand Trunk System if increased facilities, which I shall hereafter point out, were afforded.

I learnt, for instance, from Mr. Spencer, the Steamboat Agent at Chicago, on the 4th of October, 1867, that he could easily have secured eight steamboat loads, of 6,000 barrels each, per week, at rates averaging \$2 a barrel, for Boston and Portland *via* Sarnia, if the Grand



certain

31st,  
1865.

58	114.70
24	130.42
52	126.58
34	114.98
55	39.88
13	98.43
12	15.77

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Trunk Company had been in a position to forward them ; that thousands of barrels were then passing over his dock to the Buffalo boats which would have been sent more conveniently and in preference *viâ* Sarnia ; and that the rates would then have continued better than the highest of the Grand Trunk Local Tariff up to the close of navigation. In the autumn of 1865, also, the through rate in flour was \$2.60 per barrel, of which the Grand Trunk proportion was \$1.95, while the local rate from Sarnia was \$1 in gold. Mr. Spencer was of opinion that if better facilities for the carriage of through freight could be given there was "hardly a limit to " what could be done," and " that a daily line could be " fully loaded throughout the season of navigation if " property could be taken at Sarnia and shipped thence " (by railway) without detention, instead of running " only a tri-weekly as now, and even then being com- " pelled to run the boats to Buffalo just at the time " when the freights become most plentiful and rates the " highest," and he added, "I trust the troubles that " have occurred this way every season will be remedied " the next."

There were, however, 12 Steamboats (including 5 of Evans' line) running in connection with the New York Central Railway, 12 (of the Western Transportation Company) in connection with the Erie Railway, and 7 (of the Northern Transportation Company) to the Ogdensburgh Road, all in direct competition to eastern points, with the Grand Trunk system.

**Chicago.**

The Population of Chicago has increased from 4,853 in 1840 to 208,000 in 1866, and (as estimated) 220,000 in 1867. Its commerce is one of the marvels of the age. There were forwarded from this city in the years 1854, and 1866-7, respectively,

			Year ending 31st March, 1866-7.
1854.			
Flour (barrels)	...	111,627	2,197,787
Wheat (bushels)	...	2,306,925	10,341,549
Corn (bushels)	...	6,626,054	32,953,530
Oats (bushels)	...	3,229,987	9,564,223
Rye (bushels)	...	—	1,489,895
Barley (bushels)	...	147,811	1,398,528
Hides (lbs.)	...	43,166	23,334,791
Hogs (No.)	...	—	672,769
Hogs (packed)	...	52,849	639,382
Beef Cattle (No.)	...	11,221	260,833
Beef Cattle (packed)...	...	23,691	25,998
Sheep	...	—	95,000
1855.			
Seeds (lbs)...	...	2,484,913	13,316,210
Wool (lbs.)...	...	2,158,462	12,891,933

The "Union Stock Yards" cover 345 acres of prairie land on the south of the city, four miles distant from it. Upwards of a million dollars have been expended on them, nine railroads communicate with them, and they contain, including a magnificent hotel, every possible convenience for man and beast.

The Grand Trunk Company are, as will be seen by the distances already given, in a tolerably good position to compete for those portions of this vast traffic which go to Boston and to all points between Boston and Portland, but they are under a great disadvantage as regards New York. They have 1,487 miles to traverse by way of Portland, in place of distances by the other routes varying from 918 up to 1,012 miles; and they have an inconvenient Ferry over the Niagara River between Fort Erie and Buffalo to connect them with the New York Central Railway, and no connection at all with the Erie Railway at Buffalo. It has been considered desirable, in order to load cars which would otherwise return empty from the East, or to fill up Local trains, or for other reasons, to carry freight over the 1,487 miles *viâ* Portland between New York and Chicago; and the steamers between Portland and New York afford the means of obtaining such traffic to a considerable extent; but considering the very low rates at which it must be carried, it is, to say the least, a question for your careful investigation whether the Company would not do better without it.

On the other hand, the route *viâ* Sarnia and Buffalo has many natural advantages, and would command a heavy and paying traffic, if only there were proper facilities for its conveyance. The distance by the Grand Trunk and Erie Railways from Chicago to New York, is, as I have already shown, no greater than by the Great Western and New York Central Railways; and the benefit of such traffic would be received over 259 miles of the Grand Trunk system. The city of Buffalo was

once a great western mart, and now, containing upwards of 100,000 inhabitants, forms the principal intermediate market between Chicago and the eastern cities. Its connections with Albany, Boston, and New York, by the New York Central, Hudson River and Erie railroads, and the Erie Canal,—with the Hudson River, also from Albany to New York, secure its position. And the products of the west are frequently offered at its market before travelling further eastward.

### Buffalo Ferry and Bridge.

The existing ferry across the Niagara River, between Fort Erie on one side, and Black Rock, near Buffalo, on the other, is in an exposed and inconvenient situation. The steamboat is frequently delayed in certain states of the weather, so that it is impossible for passengers to “make their connections” with the New York Central and Erie Railways. There being no track to connect the Grand Trunk (any more than the Great Western) system with the Erie Railway, passengers and freight have now to be carried by road for a considerable distance between the two stations. The Grand Trunk is thus placed at a great disadvantage in competing with other lines. The cost of working the ferry, including repairs to the steamboat and engines, is \$30,000 per annum. The maintenance of the works at the landing places, including the swing bridge at Buffalo, will cost next year \$11,000, and in subsequent years \$6,000 to \$7,000. Nearly \$30,000 a year is paid to the New York Central Company for the use of three miles of their track. The present ferryboat has been working for upwards of 10 years, and for the

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greater part of that time by night as well as by day. I examined her in dock at Buffalo, while she was undergoing a thorough repair, and observed that it would be impossible to keep her afloat for more than four years longer. The cost of a new boat at the end of that time would, after deducting the value of the old one, be \$100,000.

Omitting salaries and wages, allowing for interest on capital to be expended in the new boat required in 1871, and adding it to the above items, the annual cost of working and maintaining the Ferry, and of the connection with the New York Central Railway, may be set down at \$70,000, which, at 6 per cent., represents a capital of \$1,166,666, say of £239,000; or, at 7 per cent. of £200,000.

The project for an International Bridge at this place which promised so much a few years since appears now to have fallen to the ground. Assistance can no longer be expected from the companies which were to have joined in carrying it out. The bridge might, if money can be raised for it, be more economically built by the Grand Trunk Company than if arrangements were made with a separate company for its construction, and it would be a permanent advantage to the Company to have entire possession of it. It should be constructed with solid piers, either of masonry where the bed of the river is rock, or with large iron cylinders filled with masonry where it is of softer material. In the superstructure, cheapness of construction might be combined with safety and facility for repair by the employment of girders, to which I shall elsewhere refer, made up of a

wooden (Howe) truss, with a bottom boom of riveted iron plates. Allowing £100,000 for 9 miles of railway (on both sides of the river) in connection with it, including the cost of the necessary land round the city of Buffalo and the approaches, and £150,000 for the bridge itself, its total cost would amount to £250,000. The cost of working and maintaining it would be less than that of the existing ferry, and the remainder may be considered on the abandonment of the ferry to go towards the construction of the bridge.

### Break of Gauge.

There would still, however, be two breaks of gauge between Chicago and Boston, or New York. The gauge of the Grand Trunk Railway from Sarnia to Buffalo is 5 ft. 6 in. The gauge of the Michigan Central and Michigan Southern Railways in the west, as well as of the Detroit and Port Huron branch, is 4 ft. 8½ in., and the gauges of the New York Central and Erie Railways in the east, are, respectively, 4 ft. 8½ in., and 6 feet. This inconvenience has led to the project, so frequently advocated, for laying down 200 miles of third rail between Sarnia and Fort Erie. But I cannot recommend that any provision should be made for carrying out this scheme. The cost of it would not be less in its entirety than £175,000. The gauge of the Erie Railway would still be different from either of the gauges thus laid on the Grand Trunk Railway. And a little consideration will show that the benefit to be derived from it would

not be commensurate with the above cost. The distance between Chicago and New York is 965 miles by the Michigan Central, Grand Trunk, and Erie Railways, or 989 miles by the Michigan Central, Grand Trunk, and New York Central Railways, while, Detroit and Buffalo, important cities, containing respectively 120,000 and 100,000 inhabitants, are favourably situated for change of vehicles or for stoppage. Detroit is 284 miles from Chicago. Buffalo is 447 miles by the New York Central, or 423 by the Erie Railway, from New York. It is far more desirable and agreeable (especially in America) for the passengers to change carriages every 300 or 400 miles, as at Detroit and Buffalo, than that they should go through without change for upwards of 900 miles and 36 hours, if only the change be made at convenient hours, with proper accommodation, and not too hurriedly. The carriages require to be cleaned and ventilated after a journey of about 300 miles. Sleeping carriages are necessary for one part of the journey, and day carriages for another part; and it is better in this particular case to keep them more or less distinct rather than to use a combined carriage for both purposes. It is absolutely necessary, also, in the case of cattle and hogs, that they should be taken out of the cars at such intervals for rest and food, besides which they are frequently exposed for sale at Detroit or Buffalo on their way eastward. Transferring traffic from one car to another is with some classes of freight a very simple and cheap operation. And it is, in fact, only with regard to a small proportion of the whole traffic



that it is necessary, or even desirable, to make some arrangement by which transshipment or break of bulk shall be avoided. A variety of suggestions have been made for avoiding such transshipment—as, for instance, compound wheels with double treads, and wheels shifting on their axles; and “compromise” wheels, with treads of extra width, are in common use on the railways connected with or running through the State of Ohio, by means of which the cars run with great if not equal safety and facility along the 4 ft. 8½ in. and 5 ft. gauges. But it so happens that the cars in use in America are peculiarly adapted for being transferred without interfering with their loads from one gauge to another. They run invariably on “bogie-trucks,” connected with the bodies by a central pin only. The bodies and trucks may therefore be made interchangeable, and different trucks may be made for the same body, adapted to any gauge. There would further be no difficulty in changing the trucks without unloading the cars,—by lifting the bodies, and by running out the trucks of the gauge on which a train has been travelling and running in trucks for the gauge on which it is about to travel, if suitable arrangements were made for the purpose. The lifting may be done, of several cars at once, by hydraulic apparatus, or by steam cranes. By lifting five cars at a time, the trucks of a train of 20 cars would be changed in four operations. Allowing ten minutes for each, the time occupied would be 40 minutes; or, say an hour’s delay would occur at each of two places in consequence of two breaks of gauge in a journey of 965 miles, occupying perhaps four days.

But from this delay should be deducted the time that would otherwise be devoted to examination and lubrication of the trucks at the same places. And it would be rather an advantage, under any circumstances, to send forward freshly examined trucks every 300 or 400 miles. As the changes would only occur at the two ends of the Grand Trunk system, there could be no confusion consequent upon the trucks of the cars being in one place and the bodies in another. It would be, as I have explained, only a proportion of the freight traffic, and none of the passenger and cattle traffic, that would require such a change. And the expense of the necessary apparatus, with its maintenance and working, would be very trifling compared with £175,000,—the expense of laying a third rail for 200 miles between Sarnia and Fort Erie, and of making alterations consequent upon it in the way and works. It is desirable for other reasons, as well as with a view to the cars working thus over different gauges, that the bodies and trucks should be made interchangeable, and on a uniform pattern, in the case of all renewals and all additions in future to the rolling stock.

The break of gauge between the Grand Trunk Railway and the connecting lines at either end of it, will cease under the above arrangement to be a serious inconvenience to the through traffic, or any bar to the utility of the bridge over the Niagara river at Buffalo. That bridge will enable the Grand Trunk Company to compete successfully with the Great Western Company for all traffic between Detroit and Buffalo, and will go far to destroy the position of temporary superiority as regards through traffic in which the third

rail lately laid down and the Suspension Bridge has placed the Great Western Company. That company carried about 17,000 through passengers, and received from them about \$112,000 during the month of September by that route, while the Grand Trunk Company received only \$18,000 from 2,901 through passengers. The passenger and freight traffic over 259 miles of the Grand Trunk system would, apparently, both be quadrupled, and the stock yards of Chicago would be brought into direct connection with those of Buffalo over that system, by the construction of this bridge, and the contemplated portions of line at either end of it.

#### **Widening of Gauge, Detroit to Port Huron.**

But to obtain this result another measure is requisite—the widening of the gauge between Detroit and Port Huron. This line, 59 miles long, was originally laid on a gauge of 4-ft. 8½-in., under the idea that the narrow gauge cars of the Michigan lines would thus be enabled to go forward as far as Port Huron. But experience has shown that a considerable amount of traffic is lost because these companies do not care to send their cars forward. And the delay which now takes place in transshipment at Port Huron is all time lost, during which the broad-gauge stock would be better employed in running backwards and forwards to Detroit. Passengers arriving from the Michigan lines are now obliged to change at Detroit or Detroit Junction into the narrow gauge cars of the Grand Trunk Company, and then, after a journey

of only 59 miles, they have to change again into the broad gauge cars of the same Company. Passengers towards Michigan suffer a similar inconvenience in the reverse direction. And the freight traffic is subjected in both directions, more or less, to the same disadvantage. Passengers and freight to and from Detroit only are transhipped at 59 miles from their place of starting or arrival as the case may be. The narrow-gauge rolling stock of this branch consists, besides engines, of 12 passenger, 3 baggage, and 60 freight cars, which are, as regards freight, insufficient for the traffic. Under these circumstances it is clearly for the advantage of the Company that the gauge of this branch should be widened as soon as possible to 5-ft. 6-in., in order that it may be the same as on the other 1,318 miles of the Grand Trunk system, and that the cars may pass from the Detroit line to other parts of the system without transshipment. The actual cost of removing the rails and re-fixing them, (which must necessarily be done rapidly) would be...

Sheds, &c., for transshipment of freight at	...	...
Detroit junction would cost	...	3,000
Rails and crossings for the Michigan Central Railway, the Company having consented on receiving them to add a third rail to their line, after deducting for old rails taken up from mixed-gauge sidings at Port Huron	...	2,500
New broad-gauge trucks for 75 cars	...	5,000
The duties on broad-gauge engines sent	...	

Carried forward ... £13,500

	Brought forward	...	£13,500
across the frontier would amount at the			
present rate to	...	...	5,000
Setting contingencies at	...	...	1,500
The total cost of the alteration may be			
estimated at	...	...	£20,000

The gradients being light upon this section, and the climate, west of Sarnia, less severe than on other parts of the line, certain broad-gauge engines, which are now comparatively useless elsewhere, might with advantage be transferred to it.

Arrangements, such as I have above referred to, for avoiding the inconvenience of break of gauge, might be made at Detroit as soon as the widening of the gauge to Port Huron has been completed.

#### Ferry over St. Clair River.

There will further be required, by the time that the Buffalo bridge is completed, an additional ferry-boat at Sarnia, for the conveyance of the extra traffic that may then be expected. There are at present two ferry-boats plying between Fort Gratiot (near Port Huron), and Point Edward (near Port Sarnia), where the St. Clair River is 1,000 yards wide, named respectively the "Huron" and the "Spicer." The "Huron" has no engines, but carries 18 freight cars, on three lines of rails, on her deck; and she is swung across by the force of the current in each direction in tow of the "Spicer." The "Spicer," used principally for passenger traffic, is

well supplied with machinery. The luggage is examined by the custom-house officers during the passage. The next boat should be available for the transport of passenger and freight cars, and should be provided with engines. She will cost, with her berths at the wharves on each side of the river, £25,000, and this sum may be required in the course of two or three years.

### **Broad-Gauge Railway through Michigan.**

While in this part of the country I had an interview with a gentleman who has been engaged in the promotion of the new railway which it is proposed to construct on the same gauge as the Grand Trunk Railway from Port Huron to Chicago. I learnt from him, what has been previously stated, that there is a great demand for this railway, which would pass through a productive tract of country in the state of Michigan. Those who were interested in its construction, would, it was stated, be prepared to procure the right of way, to construct the necessary bridges and works, to complete it to formation level, to supply the sleepers and ballast the road-bed, and to fence it in where fences were required. Arrangements had been made for entrance into, and terminal accommodation in, the city of Chicago, in connection with one of the most important of the western lines of railway, on payment of certain tolls, and without any outlay of capital. It was proposed further, that a first mortgage should be created on the property in favour of the Grand Trunk Company on condition of their providing the rails and the rolling stock, and that they

should also in that case possess full rights of management and control over the line.

The capital required for this purpose would be £1,200,000. For this sum the Grand Trunk Company would be placed, for all practical purposes, in possession of a line 326 miles long, completing its means of through communication on an unbroken gauge from Portland and Buffalo to Chicago. The line would undoubtedly pay interest on the above sum for its rails and rolling stock, and it would be a great advantage to the Grand Trunk Company thus to obtain direct communication with and a terminus in Chicago. I suggested that the scheme should be formally embodied and presented, with the signatures of those interested in it, for the consideration of the Grand Trunk Board in London.

#### **Intercolonial Railway.—Reciprocity Treaty.**

There is a more immediate prospect of the completion of the extension which has so long been looked forward to at the eastern extremity of the Grand Trunk system. I found an universal desire through the New Dominion of Canada, including the provinces, for the speedy construction of the Intercolonial Railway, which has been, indeed, one of the principal objects of the confederation. The commission under which it is to be constructed has probably been, or will shortly be named; but the precise route to be adopted is a subject of anxious consideration. An inspection of the lists showing the description and quantities of articles now carried by the



steamers *via* Portland, and enquiries in New Brunswick and Nova Scotia, afforded a hopeful result. Trade has grown rapidly between those Provinces and Canada since the abrogation of the Reciprocity Treaty and the prevalence of high duties in the United States. The Grand Trunk Company, after having temporarily suffered, will ultimately benefit by the change. Flour, which was formerly imported principally from the States, now finds its way in large quantities from Canada, and will be a large item of traffic eastward on the Intercolonial Railway. Fish and sugar will travel westward in considerable bulk, and various branches of manufacture which are now springing up will add to the receipts in no slight degree. It will not pay to carry coal, which is so abundant in Nova Scotia, for so long a journey by railway, though coal will no doubt, as well as iron, be conveyed on sections of the line; but the principle advantage which the Grand Trunk Company will derive from this addition of 100 miles to its eastern end, will be, that the loss which now occurs from working the 214 miles between Richmond and Riviere du Loup, will be converted into a profit; and this alone will be a great relief to the Company. So many interests have suffered in the States that an attempt will probably be made ere long to bring about a renewal, in some shape, of the treaty; but even if it succeeds, the course of trade cannot now be expected to return to its old channels. The Canadians have derived a permanent and growing benefit from the lesson which was thus unwisely forced upon them.

**Train Mile Receipts and Expenses.**

The earnings and expenses per train mile on the Grand Trunk Railway for 1866 compare with those in the United Kingdom for 1865, as follows:—

Expenses.		Grank Trunk.		United Kingdom.	
		s.	d.	s.	d.
Way and Works ...	...	0	11½	0	5½
Locomotive charges ...	...	1	2	0	8
Maintenance of Cars ...	...	0	4	0	2¾
Traffic charges ...	...	1	1	0	8½
General charges ...	...	0	1½		
Miscellaneous (including compensation) ...	...	...		0	2½
Taxes, &c. ...	...	0	1½		
Rates, taxes, Government duty, and legal and Parliamentary charges ...	...	...		0	2¼
Discount on currency ...	...	0	4		
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		s.4	1½	s.2	5½
Earnings ...	...	5	8	5	1½
		<hr/>		<hr/>	
Profit ...	...	s.1	6½	s.2	8
		<hr/>		<hr/>	

The comparison is an interesting one, indicating the difference of circumstances, not only in the two countries, but also as to the systems of working. The train-loads are heavier on the Grand Trunk Railway,

averaging, as I have stated, 150 tons of freight, or 120 passengers per train; whereas those in the United Kingdom average only 58 tons of goods, and 73 passengers per train. The rates and fares being lower, more work has to be performed in proportion to money earned on the Grand Trunk Railway. The railways in this country are more heavily burdened as regards rates, taxes, and duties, &c. The charges for way and works, and discount on currency, are at present exceptional on the Grand Trunk Railway. The former will be reduced in a few years, under good management, to a figure nearer to the English standard, and the latter may be expected to disappear altogether. The charges in the locomotive portion of the

### Mechanical Department

are made up of 5½d. for fuel, 3½d. for wages and materials used in repairs, and 2¾d. for wages of enginemen, &c. Of these the item of fuel is the most important. The price of cordwood has from various causes increased during the last few years. The land is becoming more extensively cleared. The farmers have other employment for labour. The distance of haulage to the railway increases in certain localities. The quality of the wood, also, has degenerated, soft wood being inferior to hard wood for making steam. The total quantity consumed being upwards of 200,000 cords a year, and the price having risen from \$3.15 for a superior, to \$4.00 for an inferior quality, it may be estimated that the cost to the Company for fuel is com-

paratively £40,000 a year more than it was three years ago. Coal has now, indeed, become relatively cheaper than wood on some parts of the line, and it is desirable that copper fire-boxes and tubes should be inserted in some of the engines with a view to its consumption, particularly as wood appears likely [to rise rather than to fall in price for the future.

### Peat Fuel.

But another resource is happily opening out. The extensive peat bogs which have so long lain useless in Canada promise now to furnish for a number of years the means of hauling the traffic of the country. Mr. Hodges, after several years of labour, and after spending several thousands of pounds in experiments, has at length perfected a machine by which peat can satisfactorily be prepared for use in locomotive engines. A large barge is fitted with steam machinery for cutting, cleaning, lifting, and distributing the peat. The barge floats in a channel of water, which it forms as it proceeds. Two screws in its front cut and draw in the peat, and, working in opposite directions, draw the barge forward at the same time. The peat so cut and sucked in is dredged up by a masticating process; and all roots and indigestible matter being duly separated, the resulting pulp is ejected through a long telescopic tube over a considerable area of the bog on each side of the channel. After it has hardened sufficiently it is cut up into pieces of convenient size and shape, and these pieces

are stacked three together to dry in the sun. The system would only succeed in a climate in which the sun is powerful and may be depended on for a certain period of the year, and the work can only be carried on in Canada during certain months. It had been stopped for the season when I visited the machine in October. The peat so prepared has been found to burn well in the engines; and it can be used and stored more conveniently than wood. As a ton of it is more serviceable than a cord of wood, and as it can be delivered at \$3. 20c. per ton upon the cars of the Company, its use will probably be the means of reducing the cost of fuel to the price of 1864, and of saving £40,000 a year, or more, as the traffic increases, to the Company. This manufacture, therefore, which is now, I understand, in the hands of a company, is worthy of all encouragement. The question, whether the peat so prepared will re-absorb moisture when stacked for winter use, and thus become deteriorated in quality, can only be decided by experiment.

### Rolling Stock.

There are 298 locomotive engines on the establishment of the Grand Trunk system, of which 275 are broad and 23 are narrow-gauge engines. But the greater part of the work is necessarily done with a small proportion of them; 46 broad-gauge engines being too light for winter duty, 16 being old and of inferior construction, and 80 freight engines being capable of taking 12 to 15

cars only. Up to the year 1862 there had been no renewals at the expense of revenue. Since that date thirteen new and one second-hand, engines and tenders have been added to the stock ; considerable improvements have been made in other ways, at a cost of nearly \$300,000 ; and a total sum of \$21,550 has been expended (also out of revenue) on additions and improvements to the workshops and machinery. It is further arranged that twelve new engines—costing, say £32,000—shall for some years be charged annually to revenue, as a means of bringing the whole stock gradually into better condition. Six of these engines are now under construction in the Company's shops, and six at the Portland Works. The 29 engines on the Buffalo and Lake Huron Railway are most of them ten years old. They were in general well built, they have not been over-worked, and they are in tolerably good order. There are twenty-three narrow-gauge engines, of which fifteen are on the Champlain, and eight on the Detroit section. The latter, which had, with one exception, been many years in use when they came into the Company's possession, are neither sufficient in number, nor, in good order, and it is proposed to sell them (with that exception) as soon as the gauge of the line can be widened. The former were also old when they came into the Company's possession, but they have not since been allowed to deteriorate. The average daily mileage of each engine for the last 5 years has been 68, the average for 1866 having been 69. The average per-centage of engines under repair for the same

period has been 26. The average number of cars hauled on each train has increased as follows:—

	Passenger.		Freight.		Mixed.
Half-year ending June, 1862...	3.9	...	13.6	...	10.7
"      "      " 1866...	4.7	...	15.2	...	11.9
"      " Dec., 1862...	4.3	...	15.5	...	12.4
"      "      " 1866...	5.0	...	16.7	...	12.2

Considering the different classes of engines of which the stock consists, many of which were only intended originally for light work, and their condition, the officers of the Company appear to have done all that could be expected with them. The working expenses of the department show a considerable comparative saving since 1862, in the face of an increase in the price of wages and materials, and this saving may be expected to increase materially as the stock is improved and assimilated.

The engines which find most favour in Canada, and generally in America, are constructed with a four-wheeled bogie-truck under their leading, and four coupled wheels under their trailing ends. And engines of this description are now being built, to weigh about 32 Canadian tons, for future use on the Grand Trunk Railway. The tenders run upon two bogie-trucks. Six-wheel-coupled engines, such as are used in this country, are apt to leave the rails on an uneven or frozen road, and it is not safe to use them in Canada. The disadvantage of the existing pattern of engine is that neither the four wheels of the bogie-truck, nor the eight wheels of the tender, are available for

adhesion; and that in order to obtain sufficient adhesion for heavy loads in slippery weather, a considerable weight is required upon the four driving wheels. It is a very important object, with reference to the durability of the rails,—to which I shall hereafter refer—and especially on a road-bed which is rigidly frozen for five months in the year, to keep the weights on the wheels as light as possible. The class of engine best suited to the climate, and for the various circumstances of the case, would, I have no doubt, be an engine running on two bogie-trucks—each provided with a pair of cylinders, and four-wheeled or six-wheeled according to the work required—and without a tender. Such an engine would be peculiarly safe to travel over a winter road; would combine a minimum wear and tear, to itself and the rails, with a maximum of adhesion, and would be the most effective and most economical that the Company could employ. I had the opportunity some time ago of testing engines of this description on the Neath and Brecon Railway, designed by Mr. Fairlie, and have found the principle to be good, though certain points of detail required improvement. Such engines are also in use for the sharp curves and steep gradients of the Queensland Railway.

#### Cars.

For eighteen months previously to 1862 the painting and renovation of the car stock was almost at a standstill, in consequence of the financial difficulties of the



Company; and in September of that year the sidings of the car shops were filled with disabled cars, some of which had not worked for two years. The stock has increased since that date from 3,264 to 4,339, of which 298 are applied to passenger, and 4,041 to freight and ballast purposes. The average mileage of the cars for 1866 was 6,310. The expenses of the car department for that year was \$417,331. The average number waiting for repair was 221. The stock generally appears to be in a much better condition than five years ago; and something has been done towards bringing the bodies and trucks to a uniform pattern. But much remains to be effected in these respects.

### Springs.

The use of vulcanized india-rubber springs is very common in the United States and Canada, partially under the engines, but especially under the cars. They are easily applied, but they are neither economical nor very durable, and they are not well adapted to extremes of temperature. They make admirable "blocks" in combination with steel springs, but their use has certainly been carried to too great an extent on the Grand Trunk Railway. Steel springs ought at once to be inserted under the leading ends of all the engines. The state of the permanent way has rendered it difficult hitherto to get steel springs to stand, and the steel springs in use do not appear to have been sufficiently good or strong. But it is desirable that steel should, as the road and the

rolling stock are now improved, be substituted for or used in combination with india-rubber in the engines, tenders, and cars, for the future.

### Permanent Way and Works.

The next question, of the Permanent Way, is of primary importance, and I have therefore devoted special attention to it in passing along the line. Out of 5s. 8d. per train mile for gross receipts, and 4s. 1½d. for total expenses, 11½d. per train mile were expended in 1866 on maintenance and renewal of way and works.

The following are the principal peculiarities of the Climate of Canada, as affecting the permanent way: There are excessive expansion and contraction of the rails from extremes of temperature between summer and winter. The Line is frozen for 4 or 5 months in the year to a depth of 5 feet and upwards, and during that time it is exceedingly rigid, and the sleepers cannot be moved. Inequalities occur in the rails from irregular lifting of the sleepers at the commencement of and during the frost, and these are corrected from time to time by the process of shimming—*i.e.*, of inserting wooden packing pieces of the requisite thickness between the rail and the sleeper when the rail requires to be lifted, or of cutting away a portion of the sleeper when the rail requires to be lowered. The Rails are the more exposed to injury in consequence of the rigidity of the road-bed for so many months in the year, by heavy weights passing over them, and they have, when soft, the greater tendency to crush under those weights.

Years.	Yr.
1862	21
1863	
1864	3
1865	1
1866	3

On the break-up of the Frost, the road falls into the worst possible condition, and each summer requires to be spent in repairing the damages of the frost, and in preparing for the following winter. Good and sufficient Ballast, which is the foundation and first requisite of every permanent way, is particularly required in such a climate, to prevent, in combination with effective Drainage, irregular lifting of the sleepers from frost; to enable the rails to be properly made up and kept up in the summer and during the rains; and to provide against excessive action on the break-up of the frost. But the Grand Trunk Railway was not well-ballasted originally, and comparatively little has since been done to make up for the deficiency. About £18,000 has been expended and charged against revenue on this account. There is no difficulty in obtaining Ballast over the whole line, though it has to be led, in some cases, for considerable distances. The following quantities have been supplied between 1862 and 1866:—

**Ballast put in Track.**

Years.	Portland. Division.		Detroit. Division.		G. T. Proper.		Buffalo. Division.		Total.		Per Yard. Cents.
	Yards.	Cost. \$	Yards.	Cost. \$	Yards.	Cost. \$	Yards.	Cost. \$	Yards.	Cost. \$	
1862	21,500	6,702 22	"	"	114,464	34,999 75	"	"	135,964	41,701 97	30
1863	"	"	"	"	41,519	11,189 80	"	"	41,519	14,189 80	34
1864	3,260	1,546 22	"	"	2,400	731 57	4,030	1,034 88	9,690	3,312 67	31
1865	1,955	821 62	"	"	8,900	2,736 26	14,800	4,714 81	25,655	8,272 69	32
1866	2,100	809 85	1,400	540 00	56,800	15,869 33	18,600	5,029 46	78,900	21,762 61	27

It would now be good economy, in order to add to the durability of the Rails and Sleepers, to save labour in maintenance, to prevent injury to the rolling-stock, and generally in the interest of safety—to complete the ballasting of the whole line, and to break up at the same time the large stones which now lie in parts of it, as soon as possible. For this purpose a sum of £60,000 will be required; and inasmuch as this most necessary work has never yet been completed, it would be only fair to charge the cost of it to capital account. The maintenance of the permanent way would then, in future years, be moderate under this head.

There are numerous Cuttings on various parts of the system, of which the slopes, having never been properly trimmed and drained, are a source of much expense and annoyance every year, especially on the break-up of the frost. The estimate for completing the whole is £20,000. They require to be turfed, after being treated in other respects according to circumstances, to resist the action of frost and snow. If £10,000 were expended on these objects in the next two, and any further sum that may be required in future years, a great saving would be effected in subsequent maintenance.

As regards Sleepers (or ties) the Grand Trunk system is on an equality with other American and Canadian lines. They have, in the course of renewal, been inserted in greater number than during construction. Some of the Contractors failed this year to deliver the supplies that were ordered, and there are many now requiring renewal on some portions of the line, but con-

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Year.	Total used in Construction
1860	
1861	
1862	
1863	
1864	
1865	
1866	

sidering that they are of larger size and closer together—on the average 2 ft. 6 in., and in some parts of the line only 2 ft. apart from centre to centre—it may fairly be said that the Grand Trunk Railway is in common with other railways on the American continent, better sleepered than many of the railways in this country. The following table shows the number of sleepers that have been laid down in the main line for 7 years:—

**Ties put into Main Line.**

Year.	Detroit.	Western.	Central.	Montreal & Island Pond.	Quebec and Richm'd.	Riviere du Loup.	Portland	Cham- plain.	Buffalo and Goderich	Total.
Total used in Construction.	124,600	401,300	707,500	304,100	202,750	250,000	316,800	182,600	352,000	2,841,650
1860	Nil	20,000	60,288	54,390	25,084	Nil	72,705	..	..	232,712
1861	Nil	17,874	59,520	51,600	31,686	..	43,296	..	..	205,866
1862	180	27,604	124,388	49,216	44,117	8,660	17,036	..	..	271,201
1863	Nil	36,628	173,200	42,775	53,672	12,675	61,554	..	..	380,504
1864	2,937	64,556	224,844	44,638	35,375	16,265	75,952	14,229	38,369	517,185
1865	12,022	81,349	167,777	26,600	13,985	23,012	91,900	13,032	81,788	512,165
1866	24,635	58,490	63,737	32,295	35,713	35,000	65,270	10,000	57,294	382,434
									Total	2,502,367

They average, as will be seen, 357,481, or about one-eighth of the whole number, for each year. The woods principally employed, as they can best be obtained, are white oak, tamarak, rock-elm, hemlock, red cherry, and red beech. The five latter cannot be made to last satisfactorily for more on the average than six, or

the white oak for more than eight, years. Cedar Sleepers, which are cheaper in many districts, which are usually of larger size, and which (being less subject to decay) will last twice as long, have fallen into disuse. Being softer, they do not hold the spikes so well in the first instance, especially in presenting a resistance to lateral action on the curves. But there appears to be no good reason why they should not be employed on the straight portions of the line. After three years' wear they are at least on an equality, as regards holding power, with the average of the other descriptions. And even on the curves, two spikes in place of one on the *outside* of the rails, or, what would be better in the case of sharp curves, a wedge-shaped piece of timber, secured by two spikes to the sleepers on the outside of the rail, would render them more safe and serviceable than any others. Being more elastic than other sleepers, they would also tend to save the rails when the road is in a rigid condition during the winter; and I have ventured to suggest another expedient which would, I think, be of service in this respect. A piece of tarred felt half an inch thick inserted on each sleeper and under each rail, would probably afford the advantages, (1) of deadening the blows which the rails receive, particularly at the joints, from the wheels of the engines and cars as the trains pass along the line when it is frozen; (2) of preventing the rails from working into the sleepers; and (3) of lessening the tendency of the spikes to draw. It is neither necessary nor desirable that any charge should be made to capital account for

sleepers. They must all be renewed, as occasion requires, in the course of maintenance. Taking the life of a cedar sleeper at 12 years, the average life of the sleepers in future at 10 years, and the average cost at 24 cents, or a shilling a piece; then, with 3,000,000 sleepers in the track, and 300,000 renewed annually, the permanent maintenance under this head would not exceed (besides labour) £15,000 a year.

### **Rails.—Renewals effected and required.**

The question of Rails is far more serious, and is of great importance with reference to the future of the property.

The greater part of the Permanent Way was originally laid with a  $\Omega$  (bridge) rail (called in Canada U rail) weighing 63 lbs. to the yard. These rails were not of good quality, and their joints were badly fastened by light chairs, consisting of wrought-iron plates partly bent up on each side to catch the ends of their flanges. The first chairs weighed 11 lbs., and others, supplied later, 13 and 14½ lbs. each. The rails of this and other sections were (and are still) secured to the sleepers according to the simple method—so common on the continent of America, as well as on the continent of Europe—of what are called in England *dog-spikes*.

The mileage of Renewals between 1st January, 1860, and the 14th September, 1867, is given in the following table:—

## Renewals of Iron—In rails.

Years.	Detroit.	Western.	Central.	Montreal & Portland.	Quebec & Richmond.	Beviere du Loup.	Portland.			TOTAL.
1860	Nil.	9½	34	14¾	14½	„	12½			75½
1861	„	9¼	30	14	1	„	12			66¼
1862	„	4¾	47	19½	„	„	9½			80¾
1863	„	21¾	59¼	25½	1	„	18½			126
1864	„	37½	59¼	13¾	2¼	„	31	2½	9¾	144
1865	2	20	33½	8¼	„	„	20	1½	10¼	95½
1866	¾	17	36	15½	„	„	15¼		15	99½
1867	up to 14th September			...	...	...	...	...	...	101

which shows a total of 788 miles, or 98 miles a year.

These renewals have been made principally with  $\Omega$  iron re-rolled at or supplied from the following places :—

(1) 55,000 tons re-rolled from time to time at the Toronto rolling mill ; (2) about 8,000 tons re-rolled at the Bay State mills, near Boston ; (3) about 8,000 tons re-rolled at the Worcester mills ; (4) 5,000 tons supplied from England by the Ebbw Vale Company in 1862, and 2,000 tons in 1864 ; (5) 900 tons supplied by the Rhymney Company in 1864. There have been also some rails re-rolled latterly at Portland.

Of the Toronto Rails 12½ per cent. have been again renewed, and the average life of these rails up to the end of 1866 may be estimated at less than 8 years. They were at first too light, and the section was not a good



one. The later rails from that mill have been heavier and of an improved form. They were increased from 62 lbs. to the yard in 1860, to 64 lbs. in 1863, to 69 lbs. in 1864, and it is desirable that they should in future weigh 75 lbs. to the yard.

In 1865 puddled bars were imported from England with a view to improvement for the heads of these rails, but the heads so applied proved to be too soft, and it has since been found more advantageous to place the puddled bars between an upper layer of old bridge-rail iron, improved by a second rolling, and the lower bars of old iron which complete the pile. A head sufficiently hard has thus been combined with a rib and bottom flange of the requisite degree of toughness, and the puddled bar appears to have formed a good weld with the iron on either side of it.

The Rails re-rolled at the Bay State and Worcester mills have in like manner proved to be too soft, and have more or less been crushed under the weights of the engine-wheels. Nearly the whole of the former iron, and about 20 per cent. of the latter iron, has already been again removed from the track, and the rails re-rolled at Portland have shown similar indications.

Of the Rails which were sent out in 1862 by the Ebbw Vale Company and were laid down in 1862-3, 60 per cent. have already been taken out of the track, a large proportion have been shortened or repaired, and few remain in the condition in which they were originally laid. Their average life is estimated at less than five years. Of those sent out by the same company in 1864, at an increased

cost of £2 per ton, and called "steel headed," the average life will not, it is considered, be longer than six or seven years.

The Rhymney Company's Rails, laid down in 1864-5, have also worn badly, and will all be renewed again by the end of 1868.

The life of all these Rails ought, if they had been of suitable quality and of reasonably good iron, to have averaged *at least* ten years. On this assumption, and taking into account the expense of removing, cutting, and repairing, the loss to the Company from their defects may be estimated to have been *directly* in money value :—

Toronto rails, loss on 55,000 tons	... £60,000
Bay State and Worcester rails, loss on	
16,000 tons	... 40,500
English rails, loss from 1860 on 7,900	
tons	... 24,000

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Total direct loss in seven years...£124,500

But the indirect loss has been far greater. About 200 miles of rails, which ought still to be in the track, having been removed from it prematurely, the officers of the Company have found it impossible to renew other portions of the line where renewal was urgently required. The old  $\Omega$  rails employed by the Contractors during the construction of the railway, and for traffic ever since that time, have unavoidably been kept in use longer than their condition would otherwise justify. Fractures of these rails frequently occurred, and the results of these fractures

and other defects, by causing accidents and obstructing traffic, with their attendant inconveniences and delays, enhanced the difficulties of the Company to an enormous extent.

When the Company was in financial difficulty some years since, the Permanent Way fell into a depreciated condition, as is too frequently the case under such circumstances. Much time and expense would then have been required in any case to raise it from that condition. But when it became necessary to renew the new rails in place of the old ones, the difficulties of the case were, as may be imagined, materially aggravated; and it has taxed the officers and servants in charge of the track to the utmost to keep the trains running. The rails have been turned end for end cut, patched, and much worn down in the process. They have been changed from the branches to the main line, and from one part of the system to another; and those which had been once rejected from the main line and laid down in sidings, were even in some cases restored for a further term of service to the main line. It is only right by mentioning these facts to show the difficulties with which the officers now in charge of the permanent way have had to contend. The fractures that occurred were chiefly in the  $\Omega$  rails, of which  $320\frac{1}{2}$  miles remained in the track up to the end of 1866. They broke mostly, as might be expected, at a distance of 2 or 3 feet from the joint, but frequently in other parts, after being much weakened by wear and tear. These rails, originally 21 feet long, now vary in

length. It is hardly necessary to say that they must, where the traffic is heavy, be removed from the track as soon as possible,—a process which is being carried out as fast as new iron can be obtained. The best of them may, however, with improvements as to joint fastenings, which I shall presently recommend, be left longer in the track on those parts, as, for instance, on the 250 miles east of Richmond, where they have been less worn, under a very light traffic, and with fewer trains.

The following table shows the distribution of these  $\Omega$  rails, of fish-jointed  $\Omega$  rails, and of  $\Omega$  rails in chairs, on the 31st December, 1866.

**Description of Rails in Main Line, 31st December, 1866.**

DISTRICT.	Fish Jointed $\Omega$ Rails.	$\Omega$ Rails.	In chairs $\Omega$ Rails.	TOTAL.
	Miles.	Miles.	Miles.	
Detroit ... ..	59	...	...	59
Western ... ..	107 $\frac{1}{2}$	82 $\frac{1}{2}$	...	190
Central ... ..	253 $\frac{1}{2}$	79	2 $\frac{3}{4}$	333
Buffalo and Goderich ... ..	69 $\frac{1}{2}$	...	91 $\frac{1}{2}$	161
Berlin Branch ... ..	1	6	...	7
Champlain including Bonaventure Bch.	6	...	78	84
Montreal and Island Pond ... ..	88 $\frac{1}{2}$	54 $\frac{1}{2}$	1	144
Quebec and Richmond ... ..	11 $\frac{3}{4}$	14 $\frac{1}{4}$	70	96
Riviere du Loup ... ..	...	118	...	118
Arthabaska ... ..	...	20	15	35
Portland... ..	102 $\frac{1}{4}$	46 $\frac{3}{4}$	1	150
	697 $\frac{1}{4}$	320 $\frac{1}{2}$	256 $\frac{3}{4}$	1,377

Considerable changes have been made since that time, and, indeed, the Track varies from month to month, and even from day to day, as new or re-rolled rails are received and placed in it, as the best of those released are repaired and re-inserted elsewhere, and as the worst are sent away for sale or to the rolling mill. Care is taken, in laying in the new rails, to give them a fair chance as far as sleepers and ballast are concerned. Where they have been recently laid down, and in many parts of the line, the track is in fair or in very good working order. There are, on the other hand, portions, chiefly where the original  $\Omega$  rails remain in the track, where renewal is still urgently required. And the parts which are in good order are much intermixed with the parts which are in bad order on different parts of the system. Where the joints of the rails are fished there is frequently a want of fish-bolts, owing principally to the difficulty of punching or boring the rails which have been cut after having been injured or crushed at the ends, and partly to the impossibility of getting the platelayers, who are obliged constantly to be changing defective rails, and keeping up the permanent way under disadvantageous circumstances, to attend sufficiently to this part of their work. Punching machines are much required in the different districts, to save the labour of drilling by hand, which is the only means at present available, and a first step towards supplying them has now been taken. Mr. Sacré, the engineer of the Manchester Sheffield and Lincolnshire Railway, has been good enough to interest himself in the matter at my request written from

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Canada; and Mr. Woodhouse has kindly furnished Mr. Brydges with the particulars of the machine used on the London and North Western Railway.

I am disposed to recommend that the weight of the Re-rolled Rails, as well as of those sent from England, should not in future, on any part of the line where the traffic is considerable, be less than 75 lbs. to the yard. A section similar to that which was last approved by the Board may advantageously be adopted.

#### Joint Fastenings.

The shape of the fish plates for the  $\Omega$  rails may be much improved, and considerable allowance is requisite for the expansion and contraction of the rails during the extremes of temperature. For this purpose it is found desirable to afford ample margin in the holes in the fish-plates as well as in those of the rails. The system of suspended fished-joints has not been found to answer well in Canada, and that of placing the joints over the sleepers has many disadvantages. The ends of the rails suffer from being hammered by the wheels of the rolling stock, especially when the road-bed is frozen and rigid. The bolts are apt to get loose. When the joint sleeper is lifted by frost, or when the sleepers on either side of it are thus lifted, a bad joint is formed. A better method of treating the joints, applicable to other places where the  $\Omega$  rail is employed as well as to Canada, is that of combining suspended fished-joints with a supporting plank of oak  $2\frac{1}{2}$  inches thick by 8" broad, under the rail, and resting upon the sleepers on either side of the joint.

This plank affords support to the rails at the joint, which they require in consequence of the fish-plates not being deep, and it leaves at the same time enough of elasticity to prevent hammering on the ends of the rails. The planks should be let into the sleepers on which they rest, both for lateral stability and in order that the sleepers may not be on a lower level than the intermediate sleepers, in which case they would be differently affected by frost. I observed an extraordinary degree of smoothness on a short portion of the Champlain Line, in consequence of a supporting plank of this sort having been laid under the plate-chairs at the joints of the rails; and I was altogether so much pleased on further examination with the effect of it; that I had no hesitation in recommending its adoption generally on the Grand Trunk system. It is cheap in application, and suitable to the country, and it will effect a material saving in the ends of the rails, where they wear out most rapidly.

A great deal of trouble having been caused by the fish-bolts getting loose, I have recommended that the ends of the bolts should, before they are inserted in the rails, be dipped in Stockholm tar,—a precaution that has been found very efficacious in this country for keeping the nuts tight, for preserving the bolts, and for facilitating renewals.

The  $\Omega$  rails also would have lasted for a longer time, would have been less subject to fracture, and would not have occasioned so much damage to the springs and other portions of the rolling-stock if they

had been better secured at the joints. There are great numbers of them now in the track which will necessarily be employed for several years, and which may be so employed satisfactorily under light engines and light traffic if their joint fastenings be improved. This would be good economy, as tending to prolong their life, to prevent accident, and to save the rolling-stock. I have forwarded to Canada (through the kindness of Mr. Ilberry) sketches of the modes which have been adopted with rails of a similar though heavier section on the Great Southern and Western Railway of Ireland. Either a saddle-plate or a steel clip, such as have been used on that railway, combined with the supporting plank above referred to, would form a very efficient fastening; but a cheaper system, and one better adapted as a temporary expedient to this particular case, would be the combination of the supporting plank, the existing chair, and the wooden splice (so common in America) outside the rail, similar to the fastening before referred to as having been applied on a portion of the Champlain Railway.

#### **Durability of Rails.**

This question of Joint Fastenings is, as affecting the life of the rails, of greater importance in an economical point of view, than might appear at first sight; but that of the quality and suitability of the rails themselves is still more serious. The difficulty of obtaining durable rails of iron has of late years been very generally felt, and has induced an outcry for steel rails in quarters where it would not otherwise have been heard. Much



trouble has resulted, and much expense been incurred, for the want of rails of good quality in England, and still more in the United States and in Canada. The heavier rails laid down of late years in the United Kingdom, have, in some cases, been outlasted by the lighter rails of previous years. The climate of Canada—severe as it is for 4 or 5 months every year—has been made to bear more than its share of blame for the failure of rails that would not have been durable in any climate. And in Canada, as elsewhere, after the failure, from lamination, of steel-headed rails, it has been considered that it would be better economy in the end to lay down steel rails than to continue to use iron with such lamentable results. The number of fractured rails (already referred to), and the softness of some of the rails laid in the track of late years, have, indeed, been sufficient to induce everyone concerned to desire a change of some description, and almost to create a panic as to the effect of the climate.

But I have, after careful inspection and inquiry, become convinced that iron rails of appropriate form, of suitable and reasonably good quality, and of sufficient hardness in the heads, may be made to last on most parts of the main line for 15 years, and on the average of the Grand Trunk Railway for very much more. There are, in fact, rails now in the track which have carried a heavy traffic for periods varying from 10 up to even 20 years, in spite of every disadvantage. As I have already stated, their section was weak, their quality too often inferior, their joint-fastenings bad, the sleepers often

further apart than at present, and the ballasting defective. Their durability has, under these adverse circumstances, been in some cases extraordinary. Good iron rails, of stronger form, on sleepers 2-ft. to 2-ft. 6-in. apart, in good ballast, with well fished joints, and well maintained, must give a still better result. The real question to be solved, as far as new rails are concerned, is how to obtain suitable material from the manufacturers. In the case of re-rolled rails it is necessary to provide for the heads an iron which shall be sufficiently hard, and shall unite with that quality, good welding to the remainder of the pile. I do not anticipate any difficulty in the latter case when once the precise requirement is well understood. The best chance of procuring new rails of superior quality lies probably in insisting on a longer term of guarantee for the rails supplied, in employing the most reliable manufacturers, and in paying a price commensurate with the value of the article. No manufacturer need have any fear of prolonging the guarantee to 7 or even 10 years if he only furnish a suitable rail; and in order that there may be no doubt as to what is required, I have caused a number of samples to be taken from various parts of the track and forwarded to England, showing in sections of fracture those qualities which have failed most completely, and those which have best withstood the climate and the traffic. They comprise specimens of  $\Omega$  rail and  $\text{♀}$  rail, which have been in use for 20 years. Some of the Coalbrookdale iron between Montreal and Lachine, which has been in the track for that period, will probably last five years longer.

### Bridges and Fencing.

The condition of the Bridges does not call for any special remark. The magnificent Bridge over the St. Lawrence, at Montreal, is, in good order. The greater number of the other bridges are of iron and masonry, or brickwork. Some of the timber bridges are being strengthened or renewed, especially a large one near Paris. The system known as the Howe Truss, is that which has deservedly met with the greatest approval for wooden bridges. It is far superior to the McCallum Truss, which has also been largely employed on the Grand Trunk Railway, and elsewhere. But it would be a great improvement if, in all future renewals of these bridges, the bottom chords or booms of the girders were formed of rivetted plate iron. The lower chord is, in the case of the Howe Truss, the only portion of timber which is in tension, or which is a source of risk. It might be replaced by iron at a small additional per centage of cost. The wooden girders being twice as deep as the iron ones, only half as much iron would be required in the bottom booms of the former as in those of the latter. The remaining wooden portions of the trusses could, if the bottoms were of iron, be repaired, by the insertion of new parts as they were required. Such a bridge would, in fact, combine facility of repair with nearly the cheapness of wood, and all the safety of iron.

The Fencing is on many parts of the line in good order. In other parts, and especially on the Portland section, it requires renewal. It is too much subject to destruc-

tion by fire during the dry season. But it is not, comparatively, a heavy item.

### **Cost of Future Maintenance.**

Looking, then, at the system as a whole, it is impossible to contemplate any abatement in the estimates which have been furnished for Maintenance and Renewals of Permanent Way and Works for the next two years. It will require on the average, £120,000 to £130,000 a year for "maintenance," £130,000 for "renewals," and £20,000 for "improvements," making a total between Revenue and Capital of, say, £275,000 for the present and two following years. And to this must at once be added £60,000, as explained above, for Ballasting, and £10,000 for the improvement of the Cuttings, both to be charged to capital. The above amount of £275,000, is, after all, less than the average amount which has been charged on this account in the years 1861, 1865, and 1866. The total charge for maintenance, renewals, and improvements in 1864, was £263,497—in 1865, (including what was brought forward from suspense account) £368,427—in 1866, £263,682. But the maintenance of the Permanent Way and Works ought not on the other hand, to demand, in future years, a constant charge so great as has been anticipated. When once the track has been got into good order, with better rails, cedar sleepers, good fished-joints, sufficient ballast, and the other improvements which I have suggested, the annual cost for maintenance will, under good management, fall within reasonable proportions.

A sum of £140,000 a-year will then be sufficient, as *for the existing traffic*; being about 10 instead of 18 per cent. on the gross receipts; and 6½d. instead of 11½d. per train mile; and requiring about £100 instead of £180 per mile per annum of single line to keep the way and works in proper order. The descent from the greater to the smaller sum must, of course, be gradual; but, as the line approaches to a more perfect condition the benefit will be gradually felt, in fewer mishaps, in reduced compensation charges, and in reduced charges for maintenance—the actual charges increasing, of course, with the increase of the traffic.

This sum may seem, to those who are accustomed to consider the amounts per mile per annum required for Maintenance and Renewals of Way and Works on the principal lines in this country, to be insufficient; but there is no greater fallacy than that of instituting exact comparisons between railways placed in dissimilar circumstances. The stations and works on the Grand Trunk Railway are less numerous, and the receipts unfortunately much lighter, than in the United Kingdom. The Grand Trunk receipts were only, after deducting discount on American currency, £17. 7s. per mile per week for 1866. The cost of maintenance and renewals in the year 1865 was, on the London and North Western Railway, £192 per *single* mile per annum, but for a traffic of £52. 5s. per *single* mile per week, nearly three times in money value that of the Grand Trunk. The cost on the Lancashire and Yorkshire was similarly

£198, for receipts of £50. 5s.; and the cost on the North Eastern £148 for receipts of £35; while the cost for way and works on the railways of the United Kingdom was, in the same year, £151 per single mile per annum, on receipts of £33. 4s. per single mile per week, or nearly twice those of the Grand Trunk Railway.

Under these circumstances it is not taking a too sanguine view of the future to state that a *proportionate* saving ought to be thus effected before many years have passed, of £115,000 a-year upon the expenditure *out of revenue* for way and works for the last three years; and this is one hopeful feature of the undertaking.

It seems to be very desirable, in the meantime, that the two items of Renewals and Maintenance should in future be included under one heading. The renewals cannot be conducted regularly and continuously as is more or less done in this country, and cannot, therefore, so properly be kept separate. The difficulty is universal, from the lowest servant to the highest officer of the Company, and constant from the beginning to the end of each half-year, to determine what portion of the work which is done in the course of maintenance should be charged as "renewals," and what portion of the renewals should be charged as ordinary maintenance. No precise rule can be laid down in this particular case to determine what portion of these maintenance renewals is comprised within the term ordinary, and how much is extraordinary. The only distinction that can usefully be made is between Capital and Revenue, and this should, I submit, be strictly adhered

to as directed by the Arrangements Act of 1862;—all new work and improvement, in extra stations or warehouse accommodations, in sidings, in extra weight of rails, &c., &c., being charged against Capital, and all renewals of existing work, even though of higher price and better quality, against revenue. It is, under ordinary circumstances, just as unfair on the one hand to those who are entitled to present dividends to charge to revenue what ought to go to capital, as it is prejudicial, on the other hand, to the future prosperity of a Company to adopt the system of continually increasing its capital for the purpose of avoiding payments which ought to be made out of revenue.

The season for work being short in Canada, it is desirable that the various materials required for maintenance and renewals should be provided in future at an earlier period of the year. The only difficulty in this respect is, that the heavier charges would, in that case, be incurred in the half-year, which, having the lighter traffic, is less able to sustain them. But if the principle be admitted, that the greater proportion of the materials required for the whole year ought to be supplied during the first half of it, it will only be necessary to charge to the accounts of each half-year a fair proportion of the cost of maintenance for the whole year. If this principle be not admitted, the officers of the Company will be liable to be put to inconvenience or difficulty—as has actually occurred this year—in consequence of the failure of contractors to supply sleepers, or of ships being detained at sea with

rails. And extra expense may ultimately be incurred from their not being able to carry out the work of renewals during the proper season for it, or from its being necessarily postponed altogether.

The Stations only that are on curved portions of the Line have, as yet, been generally supplied with Signals, and a reasonable request has been made that the system of signalling should be completed with a view, not only to prevent accidents by collision, but also to save the expense of employing men to protect the trains. To do this efficiently would require an expenditure of £6,000.

### **Great Western Agreement.**

I have already referred, slightly, to the subject which has been anxiously discussed for so many years, of arrangements with the Great Western Company. In 1862 an arrangement was nearly effected for a complete fusion of interests between the Grand Trunk, the Great Western, and the Buffalo and Lake Huron Companies; but the Great Western Company then considered it more for their interest to remain independent, while the other two Companies became practically united into one undertaking. The Grand Trunk and Great Western Companies have since been in competition with one another; and this competition has naturally resulted in reduction of rates, increase of expenditure, and consequently serious loss, probably of £40,000 or £50,000 a year, to both companies. The result of later negotiations has been that the Great Western Company, while



anxious to benefit by an agreement for equal fares, rates, and charges on local traffic, such as now awaits the approval of the Grand Trunk shareholders, have persistently refused to enter into a more intimate alliance with the other two Companies. This agreement will undoubtedly be very beneficial to the Great Western Company, and would, if it were carried out in a proper spirit, be of advantage to the Grand Trunk Company. It was hoped that the loaded cars of the Great Western Company would, as contemplated in clauses 3 and 4 of the agreement, be allowed to run through without the delay and expense of transhipment from certain points of the one to certain points of the other system; and that the two Companies might have been induced to work amicably together in all respects. But the practical result was, even while I was in Canada, unfortunate. The Great Western cars continued, in spite of remonstrances, to be unloaded at Paris, to the detriment of the Grand Trunk Company; and arrangements were not made, as was requested, for so loading these cars as to admit of their running forward on the Grand Trunk system. A stock agent at Buffalo had been induced, by the temptation of a higher salary, to leave the service of the Grand Trunk for that of the Great Western Company. The prospects, therefore, of the two Companies working harmoniously together under this agreement are not so good as they might be; and, indeed, the present is not a time when the Grand Trunk Company can expect to make terms commensurate with its intrinsic value and future prospects. The Grand Trunk Company is now in its worst, the Great Western

Company in its best position. Their relative conditions and circumstances will be completely altered when the bridge over the Niagara river at Buffalo, and the connections contemplated with the Erie Railway, as well as with the New York Central Railway, have been formed; when additional rolling stock has been provided; and when all the various improvements recommended in this report have been carried out. The Grand Trunk and Buffalo and Lake Huron joint line will then be in a position to benefit by a large proportion of the increasing traffic which now flows over the Great Western system by way of the Niagara Suspension Bridge, between the Western and the Eastern States. The rising fortunes of the one and the falling fortunes of the other will then facilitate the adoption of terms advantageous to both parties; and in fact the completion of the above works will inevitably lead, sooner or later, to an entire fusion of interests.

Such a fusion would save commissions to hundreds of rival agents for the sale of through passenger tickets,—would cause the agencies for the solicitation of freight in different parts of the United States to be united,—would enable the two Companies to compete jointly on more favourable terms with the American routes,—would lead to a reduction in the double service of competing trains through Upper Canada, and of the duplicate staff which is now kept up at the various stations within sight of one another,—would add to the convenience of the public by the formation of joint stations,—would lead generally to more remunerative rates.—would be the means of diverting the heavy traffic

which now passes directly from the Great Western to the American lines, for Boston and the New England States, from those lines, and of forwarding it over a longer mileage of the joint Canadian systems to their mutual advantage,—would economise the use of their joint rolling stock, by saving transshipment between cars on the same gauge,—would lead by joint management to a reduction of general charges,—and would cause a cessation of the labour and expense which must otherwise, it is to be feared, continually be devoted to the object of enabling the one or the other Company to obtain further relative advantages.

It would appear, therefore, that while an unreserved fusion of interests would be of enormous advantage to both systems, the Grand Trunk Company are not yet in a position to seek, nor the Great Western Company in a mood to accede to such an arrangement. Combination will, ultimately, become far more necessary of the two to the Great Western Company, because almost all its traffic and its whole system will be subject to competition by the Grand Trunk Company, whereas one-fifth only of the Grand Trunk system would be involved in the sacrifice which such competition would temporarily demand. The present agreement falls very far short of what is required for the avoidance—which would be most desirable—of such competition. It does not deal with the question of “foreign” traffic, which will come more prominently forward after the completion of the Buffalo bridge, and which is for the time the

principal source of prosperity to the Great Western Company; and its advantage to the Grand Trunk Company will depend upon the spirit in which it is carried out by the Great Western Company. That Company would suffer materially from bad harvests or a financial crisis in the States, and may suffer from a combination of the New York Central and Lake Shore lines, which I have already referred to as being probable. The proceedings in Canada to which I have referred, and the action which was lately taken at a Grand Trunk meeting by the Deputy-Chairman of the Great Western Company, have rendered it the more necessary that the Grand Trunk Company should be cautious in committing themselves for so long a period as seven years. Clause 10 of the agreement provides, indeed, for its termination on a three months' notice, but subject to certain differences between the managers in Canada and the Boards in England, the existence of which might be disputed, and which have reference only to "such matters" as "the rates and fares to be charged in respect of through traffic from one system to the other." It might thus be found difficult to determine the agreement, if it were expedient to do so, for any other than those particular reasons. And it would therefore, I submit, be unwise in the Grand Trunk Shareholders to confirm it without the addition of a clause enabling either party to determine it absolutely, on a six months' notice, if the necessity for doing so should unhappily arise.

### American Currency.

The depreciation of the paper currency of the United States has been frequently referred to as the most serious cause of the difficulties of the Company. The total loss on conversion of that currency, from which no adequate reduction can be made, on account of rise in fares and rates, has been, as stated in the last report of the Directors, £311,938 from 1862 up to the 30th June of the present year, or on the average,—say, £60,000 a year. The actual receipts in that currency with the total amounts paid out in the same currency, the balance, and the loss on conversion are given, as well as the balance of the receipts in Canadian currency in the following table.

Canadian Currency.		American Currency.			
Receipts.	Period.	Received.	Paid out.	Balance.	Loss on Conversion.
\$		\$	\$	\$	\$
2,471,893	1862	1,530,229	1,065,947	464,281	66,535
2,121,379	1863	2,317,887	1,517,521	800,366	129,559
2,290,291	1864	3,289,532	2,475,331	814,200	381,610
2,485,928	1865	3,985,068	2,337,032	1,648,036	460,861
2,943,946	1866	3,659,126	2,197,747	1,461,378	370,317
12,313,439	Totals	14,781,845	9,593,581	5,188,263	1,408,885

N.B.—The amount “paid out” includes \$545,000 invested in the purchase of Atlantic and St. Lawrence Bonds. This operation saved a further loss of, say \$342,000.

It will be observed from the above table that except in 1862, the receipts in greenbacks have formed the greater proportion of the total receipts of the Company ; and that the amounts paid out have borne a varying proportion of rather less than two-thirds on the average, to the receipts. Gold was quoted in New York yesterday, the 10th inst., at  $135\frac{3}{4}$ , though it has been lower since the war, and it was at one time as high as 260. This varying value of the currency in which more than half the receipts, and so much of the costs of working are paid, causes confusion in all the accounts. The "gross receipts" of each half-year, as stated in sterling, are very considerably inflated, as well as the expenses. These receipts are made up partly of American, partly of Canadian currency, and being converted into English money at the rate of Canadian currency, they represent more than their true value by the difference on upwards of half of them between greenbacks and gold. The expenses are paid partly in American and partly in Canadian currency; and they also represent more than their true value by the difference, though on a less proportion of them, between greenbacks and gold. The addition to or deduction from the one or the other of the loss by currency does not lead to an accurate result, because no account is thus taken in either case of the sums paid away in American currency. It is impossible, therefore, ever to arrive at an accurate conclusion as to the actual per centage of working expenses to receipts, though the nearest approximation to it is obtained by comparing the former *plus* loss on currency with the latter, or the latter *minus*

loss on currency with the former. The Company has thus been receiving and paying since 1862 less than has been represented in the accounts, and, further, the comparisons which have been instituted between corresponding half-years have been always inaccurate. In such comparisons no account has been taken, either of the varying price of gold, or of the varying proportions of American to Canadian currency, received or paid away, all of which are important elements in the calculation. It may even happen in a future half-year that receipts nominally less will have a greater sterling value than those of a preceding half-year. And as the receipts have appeared to be greater than they were in reality ever since gold has been at a premium, so they will be in sterling value comparatively greater as that premium gradually disappears. The only remedy for this state of things is to calculate the receipts and the expenses on a gold basis. This would, no doubt, be a source of considerable trouble in keeping the accounts, and it is a question for your consideration, whether the resulting accuracy would compensate for the labour which it would entail for the remaining period over which the existence of greenbacks is likely to be prolonged.

The more important question that arises in regard to this matter is whether the loss by currency which has now extended over so many years cannot be obviated by a corresponding rise in rates and fares. Unfortunately, the through or foreign rates and fares on the Grand Trunk Railway are governed, as I have already explained, by those of numerous competing systems. The rates for

freight have been raised on the American railroads to some extent—on an average, as it would appear, by about 14 per cent. But this increase is very small in proportion to the present depreciation of the currency, and it was inappreciable when gold was at a premium of 160 per cent. The foreign passenger fares have not been much increased since the American war. They have been kept down on the competing lines by the obligation which I have already referred to as having been imposed some years ago on the New York Central Railway, to carry passengers at 2 cents a mile. The obligation was ruled, in spite of their protests, to hold good in any legal currency. And that Company was compelled, when gold was at a very high premium, to carry passengers between Albany and Niagara Falls, much to its detriment, at fares which, calculated in gold, were ridiculously small. A similar law of the State of Michigan, prevents the Grand Trunk Company from charging more than four cents a mile on the Detroit and Port Huron section. It is probable that the through rates and fares will remain much as they are as the price of gold falls, and that an important improvement will appear, from this source alone, in the profits of the Grand Trunk Company. It would be idle, in the present state of affairs in America, to speculate as to the time when gold will be again at par. There will, probably, be a rapid fall in its price when, the periods of short indebtedness having expired, the American Government commences to buy up the \$400,000,000 of paper now in circulation.



### Prices.

The rise which has occurred in the prices of labour and materials has heretofore been generally considered as mixed up with, and even resulting from, the above question of greenback currency; whereas it appears to me to be entirely distinct from it. The two have, indeed, fallen simultaneously on the Company; and the higher prices have in the States been necessarily paid in paper. But it seems obvious, on consideration, that such a rise is a natural result of the war, and would have followed on the scarcity of labour which it occasioned, even if greenback paper had never been brought into use. There have in fact been two sources of increase—a nominal and varying rise to counteract the varying depreciation of the currency, and an actual rise as a result of the war. Be that as it may, the result of the war has been commercially very disastrous to the Company. Rails were re-rolled on the American portions of the line before the war at \$25 a ton in gold, and \$47 a ton has since been paid for them in currency. Labour has increased 40 per cent, and certain materials as much as 75 per cent, in currency. Labour has naturally been attracted from Canada by the rise of wages in the States, and wages throughout the frontier of the dominion have thus increased, to the extent, perhaps, of 10 per cent., and in some places at a higher rate. They cannot remain permanently in that inflated condition, and there is further hope, as they fall, for improvement in the prospects of the Company.

A third result of the war has been the imposition of enormous duties on all branches, and at all stages of manufacture. And the loss to the Company from these three causes has been probably upwards of £100,000 per annum.

### Conclusion.

I have thus endeavoured to describe the system of the Grand Trunk Railway exactly as I find it; to afford (1) a just idea of its present condition and of all its difficulties; (2) a complete statement of the various measures necessary for its improvement; (3) a reasonable view of its future prospects.

The greater works on the line are of a substantial character, and one of them in particular is far too magnificent for its commercial resources; but it has suffered from defects of original construction as regards its permanent way and minor works. A considerable proportion of its mileage is actually worked at a loss, and the receipts on the greater part of it are earned only by a constant struggle against numerous competitors. After the various creditors and the bond and shareholders had submitted inevitably, but at so much sacrifice, to the compromises of 1862, it appeared to be in a fair way towards yielding some return to them. But the calculations which were then made have been upset, partly by the immediate effects and the after effects of the American war, and by the supply of unsuitable iron for the permanent way, but partly also by the abrogation of the Reciprocity Treaty, by the occurrence of Fenian

raids, and by the difficulty that was at one time experienced in obtaining a settlement with the Canadian government. The cost of renewals has been a constant drain upon its resources. High prices of labour and materials, to a less extent in Canada, to a greater extent on the American sections, and heavy duties in America, have combined with low rates and fares, received partly in an uncertain and depreciated currency, to eat into the profits; and it will be easily understood that a slight rise in rates acting simultaneously with a slight fall in prices would make a vast difference in those profits. The Managing Director and Officers in Canada, while ably and honestly doing their best for the concern, have been much hampered in their operations by these and other adverse circumstances. They have had the up-hill task not only of maintaining, but of raising, as far as they could, the rolling stock as well as the permanent way, from a condition of extreme depression. That has been partially accomplished, and I have indicated not only the cost of, but also the necessity for, its completion. In the existing condition of the property, two courses present themselves for adoption. It must be allowed to go on either without, or with a fresh expenditure of capital. If no further capital be expended its improvement will, to say the least, be a gradual process; a large proportion, if not the whole, of its revenue will, for a series of years, be swallowed up in the cost of maintenance, the payment of fixed charges, and the supply of necessary means and appliances; and the prospects of cash dividends to the preference bond and stockholders will be very remote. If capital can be raised, and if it be ex

pended on the various objects which I have indicated in detail, a more speedy return to the proprietors may, with good reason, be anticipated. The latter policy is that which it is obviously most desirable to pursue, but no further expenditure should be incurred, except such as will lead to commensurate economy in working and maintenance, or which will be commercially profitable, or which is necessary to safety.

Acting on this principle, I may sum up the amounts which will require to be raised and expended on capital account, as follows:—

(1.) Bridge over Niagara River at Buffalo, with connections on both sides of the river,—to be commenced as soon as possible ... ..	£250,000
(2.) Expense consequent on, and incurred in, widening gauge on Detroit and Port Huron Railway,—to be carried out at once,—broad gauge engines being supplied from other parts of the system ... ..	20,000
(3.) Additional steam ferry boat at Sarnia, with wharfage,—berths, &c.,—to be ready on completion of the Buffalo Bridge ...	25,000
(4.) 30 engines (including 25 now under construction), 10 passenger cars, 300 freight cars,—required in the course of next year ... ..	125,000
(5.) Buildings for engines,—much required	15,000
(6.) Completion of ballasting,—say in 2 years, if possible ... ..	60,000
Carried forward ... ..	£495,000

	Brought forward ... ..	£495,000
(7.)	Trimming, draining, and turfing slopes of cuttings ... ..	10,000
(8.)	Improvements for 3 years in stations, sidings, extra weights of rails and fish-plating ... ..	60,000
(9.)	Completion of system of signals ...	6,000
(10.)	Arrangements for changing trucks of cars at Buffalo and Detroit, to obviate inconvenience of break of gauge, and an expenditure of £175,000 for third rail between Sarnia and Fort Erie,—say ...	5,000
		<u>£576,000</u>

Of this amount, about £230,000 for rolling stock, for widening the gauge of the Detroit and Port Huron Railway, for “improvements” in way and works, for the cuttings, for ballasting and signals, for engine buildings, for arrangements for changing trucks of cars at Detroit, for purchasing land on both sides of the Niagara River, and for the commencement of the Buffalo Bridge, will be required as soon as it can be provided.

In addition to the above £576,000, a further expenditure must be contemplated of:—

30 engines, 10 passengers' cars, 300 freight cars, perhaps for 1868-9, but at all events to be ready before the Buffalo bridge is completed ... ..	£125,000
Buildings for engines, by the same time ...	15,000
Further “Improvements” in way & works	30,000

Carried forward ... .. £170,000

Brought forward	...	...	£170,000
Further for cuttings...	...	...	10,000
Permanent passengers' station, and extra freight accommodation at Toronto	...		5,000
General offices, freight warehouse, and passenger station at Bonaventure Street, Montreal	...	...	25,000
Altogether	...	...	£210,000

Of these last-mentioned works the *freight* accommodation for extra traffic at Montreal and Toronto are the most pressing.

The above two amounts form a total of £786,000 ; and it may be considered roughly that £500,000 of this sum would be spent for the Grand Trunk, and £286,000 for the purposes of the Buffalo and Lake Huron Railway. But inasmuch as greatly increasing traffic, such as may be expected from the above developments, always requires increasing expenditure, and as the Intercolonial Railway may now be expected to be rapidly proceeded with, a further sum of £114,000 would be a moderate amount to be added for contingencies extending over the next six or eight years. And a total expenditure of £900,000 should therefore be anticipated, to do justice to the property, and to Canada.

The question then arises, how is this money to be raised ? The credit of the company is at the lowest ebb. It has not yet been found practicable to place the remaining £40,000 of the existing 6 per cent. equipment mortgage. That security is now nominally quoted at 80 per cent. in the market. The interest upon it was only

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paid by carrying over a deficit from the past to the current half-year. Any further mortgage must follow it in the order of precedence. A second equipment mortgage could only be issued on ruinous terms. The proprietors have expended vast sums of money, more freely than wisely, on a great highway, from which Canada has derived and is deriving infinite advantage. The city of Montreal has grown, and is growing rapidly, as an emporium for western commerce, under its auspices. The price of land and property of every kind throughout the country has largely increased in value. Manufactures are springing up. The land is becoming settled, population is growing, and facility of intercourse has been provided over the whole length of the Dominion. The proprietors have hitherto received little but hard words for themselves. They are ready and anxious to proceed yet further, in the hope of working out the undertaking to a successful issue. They are even now promoting a Bill in the Canadian Parliament for power to raise an additional £500,000. That sum would be insufficient, even if it could be issued at par, for the requirements herein enumerated. The country and the company would alike be benefited if £900,000 were expended, principally in Canada, during the next six years. It would be more profitable, as well as more satisfactory to both, if this railway, which will ultimately carry traffic on an unbroken gauge from Halifax to Chicago, were placed in a perfect condition, and were to become, as would then be the case, a favourite route for American as well as Canadian



passengers and produce, between the East and the West. Having regard to all these circumstances, the Government and people of Canada may now fairly be asked for such reasonable assistance as will suffice to improve the credit of the Company, and to enable them to raise funds for the purposes above enumerated. There are various ways in which assistance might be rendered with mutual advantage. But it would be premature to discuss them here in detail. It is sufficient, for the present, to have demonstrated the reasonable nature, as well as the desirability of the proposal.

I have the honour to be,

Gentlemen,

Your most obedient servant,

H. W. TYLER.

Having accompanied Captain Tyler in his inspection and inquiry, having been in constant consultation with him on all subjects which required attention, and having satisfied myself on the different points in question, I entirely concur in the above report.

C. W. EBORALL.